Remarks:

Applicant elects the species identified in the Action as measuring the cerebra field electric potential of Claim 56 with traverse. In view of the present amendment, however, applicant believes such a restriction is not necessary. Presently amended claim 55 includes limitations of claims 56, 57, 61 and 62 to more clearly claim what applicant considers the invention and such amendment overcomes any lack of invention unity as further supported by the following remarks.

The present invention has unity due to the inherent interrelationship of electric and magnetic fields, particularly when used in the claimed invention as applied to test persons. Specifically, regarding the Claim 56 (measuring the cerebral field electric potential) and Claim 57 (measuring the cerebral field magnetic potential), there is a strong physical and mathematical link between magnetic and electric field, and therefore a strong link between EEG (Electroencephalography) and MEG (Magnetoencephalography). That is why the "Method for generating data for assessing cognitive or sensomotor capabilities or capacities" has been already successfully executed with both EEG and MEG.

A magnetic field is a vector field which surrounds electric currents, and which is detected by virtue of the fact that it exerts a force on moving electric charges. A changing magnetic field produces an electric field (this is the phenomenon of electromagnetic induction, the basis of operation for electrical generators, induction motors, and transformers). Similarly, a changing electric field generates a magnetic field. Because of this interdependence of the electric and magnetic fields, they may be considered a single, coherent entity – the electromagnetic field.

The electric field and magnetic field are two interrelated aspects of a the electromagnetic field. A purely electric field in one reference frame is seen as a combination of both an electric field and a magnetic field in a moving reference frame.

All moving charges produce a magnetic field. The magnetic field of a moving charge is well known. (See Jefimenko's equations.) It forms closed loops around a line that is pointing in the direction the charge is moving. Jefimenko says, "...neither Maxwell's equations nor their solutions indicate an existence of causal links between electric and magnetic fields. Therefore, we must conclude that an electromagnetic field is a dual entity always having an electric and a magnetic component simultaneously created by their common sources: time-variable electric charges and currents."

The magnetic field generated by a steady current (a continual flow of charges, for example through a wire, which is constant in time and in which charge is neither building up nor depleting at any point), is described by the Biot-Savart law. This is a consequence of Ampere's law, one of the four Maxwell's equations that describe electricity and magnetism. The magnetic field lines generated by a current carrying wire form concentric circles around the wire. The direction of the magnetic field of the loops is determined by the right hand grip rule. The strength of the magnetic field decreases with distance from the wire.

Just as a changing magnetic field generates an electric field so does a changing electric field generate a magnetic field. (These two effects bootstrap together to form electromagnetic waves, such as light.) A time varying electric field generates a magnetic field that forms closed loops around the region where the electric field is changing. The strength of this magnetic field is proportional

to the time rate of the change of the electric field (which is called the displacement current). The fact that a changing electric field creates a magnetic field is known as Maxwell's correction to Ampere's Law.

Regarding the Claim 61 (using Positron Emission Tomography device, PET) and Claim 62 (using functional Magnetic Resonance Imaging device, fMRI), the situation is more complicated. Functional MRI or functional Magnetic Resonance Imaging (fMRI) is a type of specialized MRI scan. It measures the haemodynamic response related to neural activity in the brain or spinal cord. It is one of the most recently developed forms of neuroimaging. Since the early 1990s, fMRI has come to dominate the brain mapping field due to its low invasiveness, lack of radiation exposure, and relatively wide availability. Since the 1890s (Roy and Sherrington, 1890) it has been known that changes in blood flow and blood oxygenation in the brain (collectively known as hemodynamics) are closely linked to neural activity. When nerve cells are active they consume oxygen carried by hemoglobin in red blood cells from local capillaries. The local response to this oxygen utilization is an increase in blood flow to regions of increased neural activity, occurring after a delay of approximately 1-5 seconds. This hemodynamic response rises to a peak over 4-5 seconds, before falling back to baseline (and typically undershooting slightly). This leads to local changes in the relative concentration of oxyhemoglobin and deoxyhemoglobin and changes in local cerebral blood volume in addition to this change in local cerebral blood flow.

Positron emission tomography (PET) is a nuclear medicine imaging technique that produces a three-dimensional image or picture of functional processes in the body. The system detects pairs of gamma rays emitted indirectly by a positron-emitting radionuclide (tracer), which is introduced into the body on a biologically active molecule. Images of tracer concentration in 3-dimensional space within the body are then reconstructed by computer analysis.

PET neuro-imaging is based on an assumption that areas of high radioactivity are associated with brain activity. What is actually measured indirectly is the flow of blood to different parts of the brain, which is generally believed to be correlated, and has been measured using the tracer oxygen-15.

Due to limitations, PET and fMRI are used sometimes in combination in order to increase possibilities and overcome limitations. PET scans are increasingly read alongside CT or magnetic resonance imaging (MRI) scans, the combination ("co-registration") giving both anatomic and metabolic information (i.e., what the structure is, and what it is doing biochemical). Because PET imaging is most useful in combination with anatomical imaging, such as CT, modern PET scanners are now available with integrated high-end multi-detector-row CT scanners. Because the two scans can be performed in immediate sequence during the same session, with the patient not changing position between the two types of scans, the two sets of images are more-precisely registered, so that areas of abnormality on the PET imaging can be more perfectly correlated with anatomy on the CT images.

This is very useful in showing detailed views of moving organs or structures with higher anatomical variation, which is more common outside the brain. That “combination” and "co-registration" PET/fMRI are also showing that there is a link between different measuring techniques EEG, MEG, PET and fMRI and that using PET/fMRI combination can be used to execute “Method for generating data for assessing cognitive or sensomotor capabilities or capacities”.

Claims 55 – 60 and 63 - 70 are pending in the application after this amendment. The amendment, cancellation, and/or withdrawal of claims is not to be considered in any way an indication of applicant’s position on the merits of the amended, cancelled, and/or withdrawn claims. No new matter has been

added in these amendments. It is submitted that these amendments should not be objectionable.

Reconsideration of the claims is respectfully requested in view of the above remarks, and early notice of allowance thereof is earnestly solicited.

Respectfully submitted,

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